
Space Weather Forecast

Issued on Thursday, 18 July 2024 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: M-class flares expected. Chance of G1 Minor Storms late day 2 or more likely day 3 (19-20 Jul) due to Coronal Mass Ejection arrival

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity with multiple Moderate class flares observed, with the largest at 18/1014 UTC from the largest of the sunspots, in the southeast disc. This is also the most complex region on the disc, and has continued to show some slow growth and development, including a couple of small spots with both polarities within them ('delta spots'). There are a total of seventeen sunspot regions currently on the Earth-facing disc, however these are generally small and simpler than this previously mentioned spot, with little growth or some decay. The exceptions are the relatively newly numbered regions in the centre and north-centre disc, along with some recent growth south of a small sunspot in the northwest.

No Earth-directed coronal mass ejections (CME's) have been observed, however it is too soon to assess if the Moderate flare mentioned above generated one.

Solar Wind / Geomagnetic Activity: The solar wind speed was at background around 350 km/s. Interplanetary magnetic field (IMF) was Weak, its north-south component, weak and variable, but favouring a positive orientation (northward). Geomagnetic activity was Quiet throughout (Kp 1-2).

Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected with further Moderate-class flares. These most likely from the large sunspot on the southeast disc, but could be still be possible over the southwest limb on day 1 (18 Jul) due to a sunspot that rotated onto the far-side yesterday. Isolated flares are possible from across the disc, however, given the preponderance of sunspots.

Solar Wind /Geomagnetic Activity: The CMEs from the Moderate flare at 16/2206 UTC are expected to arrive either late on day 2 or early day 3 (19-20 Jul). Any fast wind from the large northern coronal hole is most likely to remain to the north and missing Earth, but with the potential for slight enhancements day 1-2 (18-19 Jul) perhaps bringing brief spells of slightly elevated winds. Mainly Quiet geomagnetic activity is expected overall, but brief Unsettled to Active enhancements are possible day 1-2 (18-19 Jul) from any fast wind interaction, and Active to G1 Minor Storm intervals day 2-3 (19-20 Jul) with any CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is likely to remain at background with no solar radiation storms expected. However, any notable flares will bring the potential for this to rise, with a slight chance of reaching the S1 Minor Solar Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	10	60	5
Strong	G3	No	1	1	2	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	75	70	70
Very Active	R3 to R5 X	No	15	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)